

WHAT IS CLAIMED IS:

1 1. A method for preparing an on-spot hydrophilic
2 enhanced slide, comprising the steps of:
3 (a) preparing a hydrophobic copolymer in a solvent to
4 obtain a solution of hydrophobic copolymer;
5 (b) coating said solution of hydrophobic copolymer onto
6 a substrate; and
7 (c) removing said solvent.

1 2. The method as claimed in claim 1, wherein the
2 hydrophobic copolymer is prepared by blending, grafting or
3 co-polymerization of a hydrophobic material and a compound
4 bearing a functional group selected from the group
5 consisting of anhydride, imide, cyclic amide, and cyclic
6 ester.

1 3. The method as claimed in claim 2, wherein the
2 hydrophobic material is selected from the group consisting
3 of styrene, urethane, ethylene, and derivatives thereof.

4 4. The method as claimed in claim 3, wherein the
5 hydrophobic copolymer comprises poly(styrene-co-maleic
6 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-
7 maleic anhydride).

1 5. The method as claimed in claim 1, wherein the
2 substrate comprises organic or inorganic substrate.

1 6. The method as claimed in claim 5, wherein the
2 organic substrate comprises a polymer polymerized by

3 organic monomers, wherein said organic monomers is selected
4 from the group consisting of a monomer of ethylene, styrene,
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,
6 and alkyl acrylate.

1 7. The method as claimed in claim 6, wherein the
2 organic substrate comprises substrate consisting of
3 poly(styrene-co-maleic anhydride), poly(styrene-co-
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 8. The method as claimed in claim 5, wherein the
2 inorganic substrate comprises silicon wafer, ceramic
3 material, glass, or metal.

1 9. The method as claimed in claim 1, further comprising
2 activating the substrate surface prior to the coating step.

1 10. The method as claimed in claim 9, wherein the
2 activating step is treating the substrate surface with an
3 acid or a base, or treating the substrate surface by plasma
4 activation.

1 11. The method as claimed in claim 10, wherein the
2 substrate is an inorganic substrate.

1 12. The method as claimed in claim 1, further
2 comprising cleaning the substrate surface before step (b).

1 13. The method as claimed in claim 12, wherein the
2 cleaning step is performed by the pretreatment with a
3 solvent and/or sonication.

1 14. A method as claimed in claim 13, wherein the
2 solvent is selected from the group consisting of surfactant,
3 water, alcohol, and acetone.

1 15. The method as claimed in claim 1, wherein the
2 coating step comprises spin coating, screen printing, roller
3 coating, curtain coating, or dip coating.

1 16. The method as claimed in claim 15, wherein the
2 coating step is spin coating.

1 17. The method as claimed in claim 1, wherein the step
2 of removing solvent comprises vacuum evaporation, heating
3 evaporation, or evaporation under reduced pressure.

1 18. The method as claimed in claim 17, wherein the
2 heating evaporation is carried out at a temperature not
3 higher than 100°C.

1 19. An on-spot hydrophilic enhanced slide, comprising:
2 (i) a substrate; and
3 (ii) a functionally active layer formed by a
4 hydrophobic copolymer, wherein said layer is coated onto
5 said substrate.

1 20. The slide as claimed in claim 19, wherein the
2 hydrophobic copolymer is prepared by blending, grafting or
3 co-polymerization of a hydrophobic material and a compound
4 bearing a functional group selected from the group

5 consisting of anhydride, imide, cyclic amide, and cyclic
6 ester.

1 21. The slide as claimed in claim 20, wherein the
2 hydrophobic material is selected from the group consisting
3 of styrene, urethane, ethylene, and derivatives thereof.

1 22. The slide as claimed in claim 21, wherein the
2 hydrophobic copolymer comprises poly(styrene-co-maleic
3 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-
4 maleic anhydride).

1 23. The slide as claimed in claim 19, wherein the
2 substrate comprises organic or inorganic substrate.

1 24. The slide as claimed in claim 23, wherein the
2 organic substrate comprises a polymer polymerized by organic
3 monomers, wherein said organic monomers is selected from the
4 group consisting of a monomer of ethylene, styrene,
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,
6 and alkyl acrylate.

1 25. The slide as claimed in claim 24, wherein the
2 organic substrate comprises substrate consisting of
3 poly(styrene-co-maleic anhydride), poly(styrene-co-
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 26. The slide as claimed in claim 23, wherein the
2 inorganic substrate comprises silicon wafer, ceramic
3 material, glass, or metal.

1 27. An on-spot hydrophilic enhanced microarray,
2 comprising:
3 (i) a substrate;
4 (ii) a functionally active layer formed by a
5 hydrophobic copolymer, wherein said layer is coated onto
6 said substrate; and
7 (iii) a biologically active material, which is
8 immobilized onto said functionally active layer.

1 28. The microarray as claimed in claim 27, wherein the
2 hydrophobic copolymer is prepared by blending, grafting or
3 co-polymerization of a hydrophobic material and a compound
4 bearing a functional group selected from the group
5 consisting of anhydride, imide, cyclic amide, and cyclic
6 ester.

1 29. The microarray as claimed in claim 28, wherein the
2 hydrophobic material is selected from the group consisting
3 of styrene, urethane, ethylene, and derivatives thereof.

1 30. The microarray as claimed in claim 29, wherein the
2 hydrophobic copolymer comprises poly(styrene-co-maleic
3 anhydride), poly(styrene-co-maleimide), or poly(ethylene-co-
4 maleic anhydride).

1 31. The microarray as claimed in claim 27, wherein the
2 substrate comprises organic or inorganic substrate.

1 32. The microarray as claimed in claim 31, wherein the
2 organic substrate comprises a polymer polymerized by

3 organic monomers, wherein said organic monomers is selected
4 from the group consisting of a monomer of ethylene, styrene,
5 propylene, ester, acrylic acid, acrylate, alkyl acrylic acid,
6 and alkyl acrylate.

1 33. The microarray as claimed in claim 32, wherein the
2 organic substrate comprises substrate consisting of
3 poly(styrene-co-maleic anhydride), poly(styrene-co-
4 maleimide), or poly(ethylene-co-maleic anhydride).

1 34. The microarray as claimed in claim 31, wherein the
2 inorganic substrate comprises silicon wafer, ceramic
3 material, glass, or metal.

1 35. The microarray as claimed in claim 27, wherein the
2 biologically active material comprises nucleic acid,
3 oligonucleotide, peptide, peptide nucleic acid, antigen,
4 antibody, enzyme, or protein.

1 36. The microarray as claimed in claim 27, wherein said
2 microarray is characterized by the on-spot hydrophilic
3 enhancement when the use of immobilization of the
4 biologically active materials.